d his

(FILE 'USPAT' ENTERED AT 16:51:31 ON 02 JUN 93)

```
L1            86 S POLYOL FATTY ACID POLYESTER#
L2             0 S L1 AND BACKMIXING
L3             1 S L1 AND (PLUG FLOW)
L4             6 S SUCROSE AND BACKMIXING
L5            29 S SUCROSE AND (PLUG FLOW)
L6             0 S SUCROSE(P)BACKMIXING
L7             1 S SUCROSE(P)(PLUG FLOW)
L8          3894 S POLYESTER POLYOL#
L9             0 S L8(P)BACKMIXING
L10            0 S L8(P)(PLUG FLOW)
L11          571 S BACKMIXING
L12         1785 S PLUG FLOW
L13            0 S L11 AND POLYOL/TI
L14            0 S L12 AND POLYOL/TI
```

=> d l3 1 cit kwic

1. 5,104,587, Apr. 14, 1992, Countercurrent liquid/liquid extraction to fractionate complex mixtures containing medium and long chain fatty acid triglycerides; Mark A. Besserman, et al., 554/175, 206, 207 [IMAGE AVAILABLE]

US PAT NO: 5,104,587 [IMAGE AVAILABLE] L3: 1 of 1

DETDESC:

DETD(58)

In . . . p. 211; C. J. King, Separation Processes (1971), p. 399. The Colburn Equation defines the relationship between the number of **plug** **flow** transfer units (stages of mass transfer) in the extraction column, the distribution coefficient of the component under consideration, the solvent:oil. . .

DETDESC:

DETD(59)

N=number of **plug** **flow** transfer units

DETDESC:

DETD(123)

The . . . fortified with vitamins and minerals, particularly the fat-soluble vitamins. U.S. Pat. No. 4,034,083 of Mattson (incorporated by reference herein) discloses **polyol** **fatty** **acid** **polyesters** fortified with fat-soluble vitamins. The fat-soluble vitamins include vitamin A, vitamin D, vitamin E, and vitamin K. Vitamin A is. . .

DETDESC:

DETD(128)

a. from about 10 to about 65% of an edible, substantially nonabsorbable, substantially nondigestible **polyol** **fatty** **acid** **polyester** having at least 4 fatty acid ester groups, wherein the polyol is selected from sugars and sugar alcohols containing from. . .

DETDESC:

DETD(154)

Countercurrent . . . cm) diameter Oldshue-Rushton column (extraction height of 6 ft. (1.8 m.)) was used and was set up to provide 6.7 **plug** **flow** transfer units. Methanol was used as the extraction solvent. Other key operating conditions are shown in the following table:

DETDESC:

DETD(169)

Countercurrent . . . a 2-inch (5.1 cm) diameter Karr column (extraction height of 10 ft. (3m.)) that was set up to provide 7.0 **plug** **flow** transfer units. Methanol was used as the extraction solvent. Other key operating conditions are shown in the following table:

=> d 14 1-6

1. 5,079,011, Jan. 7, 1992, Method using immobilized yeast to produce ethanol and alcoholic beverages; Heikki Lommi, et al., 426/11, 13, 14, 15; 435/161, 162, 179 [IMAGE AVAILABLE]

2. 4,900,446, Feb. 13, 1990, Centrifugal fast chromatograph; Norman G. Anderson, 210/657; 73/61.52; 210/96.1, 198.2, 745; 422/70; 436/161

3. 4,900,435, Feb. 13, 1990, Centrifugal fast chromatograph; Norman Anderson, 210/198.2; 73/61.52; 210/96.1, 657, 745; 422/70; 436/161

4. 4,588,506, May 13, 1986, Stimulation of biooxidation processes in subterranean formations; Richard L. Raymond, et al., 210/606; 166/246, 300, 307, 312; 210/610, 631, 747, 752, 759, 764 [IMAGE AVAILABLE]

5. 4,338,472, Jul. 6, 1982, Catalytic hydrogenolysis of alditols to produce polyols; Amalesh K. Sirkar, 568/861; 502/33, 53

6. 4,048,018, Sep. 13, 1977, Method of carrying out enzyme catalyzed reactions; Robert W. Coughlin, et al., 435/44, 94, 98, 99, 109, 137, 175, 176, 181, 280, 288, 813

=> d 14 5 cit kwic

5. 4,338,472, Jul. 6, 1982, Catalytic hydrogenolysis of alditols to produce polyols; Amalesh K. Sirkar, 568/861; 502/33, 53

US PAT NO: 4,338,472 L4: 5 of 6

SUMMARY:

BSUM(8)

Van . . . Journal of Applied Chemistry, Vol. 19, 1969, pages 43-45, hydrogenation experiments using slurried catalyst in autoclave reactor on feeds of **sucrose**, glucose and fructose in methanol-water solution to produce glycerol. Catalyst used was CuO-CeO.sub.2 -SiO.sub.2 with 0-5% Ca(OH).sub.2 addition to feed.. . . al further disclosed in Industrial and Engineering Chemistry, Vol. 9, No. 2, 1970, pages 210-212, a process for hydrogenolysis of **sucrose** to make glycerol, using two stirred reactors connected in series. The **sucrose** was mixed with methanol-water solvent and CuO-CeO.sub.2 -SiO.sub.2 catalyst and reacted at 200.degree.-225.degree. C. and 200 atmospheres pressure, after which. . .

SUMMARY:

BSUM(21)

 Reactor . . . tend to build up in the system to their equilibrium concentration levels are plug flow type catalytic reactor to avoid **backmixing** to prevent secondary and undesirable reactions and use high space velocity, such as above about 2.0 volume feed/hr/volume reactor. Higher. . .

```
=> d 17 1
```

1. 3,852,496, Dec. 3, 1974, TREATMENT OF WHEY WITH IMMOBILIZED LACTASE AND GLUCOSE ISOMERASE; Howard H. Weetall, et al., 426/41, 42, 239, 549; 435/175, 176

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=> d his

     (FILE 'USPAT' ENTERED AT 16:51:31 ON 02 JUN 93)
L1            86 S POLYOL FATTY ACID POLYESTER#
L2             0 S L1 AND BACKMIXING
L3             1 S L1 AND (PLUG FLOW)
L4             6 S SUCROSE AND BACKMIXING
L5            29 S SUCROSE AND (PLUG FLOW)
L6             0 S SUCROSE(P)BACKMIXING
L7             1 S SUCROSE(P)(PLUG FLOW)
L8          3894 S POLYESTER POLYOL#
L9             0 S L8(P)BACKMIXING
L10            0 S L8(P)(PLUG FLOW)
L11          571 S BACKMIXING
L12         1785 S PLUG FLOW
L13            0 S L11 AND POLYOL/TI
L14            0 S L12 AND POLYOL/TI

=>
```

```
d his

     (FILE 'USPAT' ENTERED AT 18:05:50 ON 02 JUN 93)
L1              1 S BACKMIXING AND 536/CLAS
L2              6 S SUCROSE AND BACKMIXING
L3            823 S BACK MIXING
L4              0 S L3(P)SUCROSE
L5              2 S L3 AND 536/CLAS
L6             34 S SUCROSE(P)RECYCLING
L7              0 S L6 AND POLYESTER#
L8             12 S L6 AND SUCROSE/TI
L9              0 S SUCROSE(P)(BACK FLOW)
L10            22 S L6 NOT L8

=> d l1 1
```

1. 4,015,067, Mar. 29, 1977, Method of preparing polysaccharide ethers and apparatus; Gordon Y. T. Liu, et al., **536/96**, **84**, **90**, **91**, **95**, **97**, **99**

=> d l1 1 kwic

US PAT NO: 4,015,067 L1: 1 of 1
US-CL-CURRENT: **536/96**, **84**, **90**, **91**, **95**, **97**, **99**

DRAWING DESC:

DRWD(21)

From . . . reactor. The large length to cross-section ratio permits very accurate control of temperature during the entire reaction cycle and inhibits **backmixing** thereby providing more uniform substitution. In addition, the time of reaction or passage through the reactor can be accurately controlled. . .

=> d l2 1-6

1. 5,079,011, Jan. 7, 1992, Method using immobilized yeast to produce ethanol and alcoholic beverages; Heikki Lommi, et al., 426/11, 13, 14, 15; 435/161, 162, 179 [IMAGE AVAILABLE]

2. 4,900,446, Feb. 13, 1990, Centrifugal fast chromatograph; Norman G. Anderson, 210/657; 73/61.52; 210/96.1, 198.2, 745; 422/70; 436/161

3. 4,900,435, Feb. 13, 1990, Centrifugal fast chromatograph; Norman Anderson, 210/198.2; 73/61.52; 210/96.1, 657, 745; 422/70; 436/161

4. 4,588,506, May 13, 1986, Stimulation of biooxidation processes in subterranean formations; Richard L. Raymond, et al., 210/606; 166/246, 300, 307, 312; 210/610, 631, 747, 752, 759, 764 [IMAGE AVAILABLE]

5. 4,338,472, Jul. 6, 1982, Catalytic hydrogenolysis of alditols to produce polyols; Amalesh K. Sirkar, 568/861; 502/33, 53

6. 4,048,018, Sep. 13, 1977, Method of carrying out enzyme catalyzed reactions; Robert W. Coughlin, et al., 435/44, 94, 98, 99, 109, 137, 175, 176, 181, 280, 288, 813

=> dohis

     (FILE 'USPAT' ENTERED AT 18:05:50 ON 02 JUN 93)

```
L1              1 S BACKMIXING AND 536/CLAS
L2              6 S SUCROSE AND BACKMIXING
L3            823 S BACK MIXING
L4              0 S L3(P)SUCROSE
L5              2 S L3 AND 536/CLAS
L6             34 S SUCROSE(P)RECYCLING
L7              0 S L6 AND POLYESTER#
L8             12 S L6 AND SUCROSE/TI
L9              0 S SUCROSE(P)(BACK FLOW)
L10            22 S L6 NOT L8

=> d his

     (FILE 'USPAT' ENTERED AT 18:05:50 ON 02 JUN 93)
L1              1 S BACKMIXING AND 536/CLAS
L2              6 S SUCROSE AND BACKMIXING
L3            823 S BACK MIXING
L4              0 S L3(P)SUCROSE
L5              2 S L3 AND 536/CLAS
L6             34 S SUCROSE(P)RECYCLING
L7              0 S L6 AND POLYESTER#
L8             12 S L6 AND SUCROSE/TI
L9              0 S SUCROSE(P)(BACK FLOW)
L10            22 S L6 NOT L8

=>
```

SUMMARY:

BSUM(10)

This . . . tube, in the draft tube itself, and in the turbulent area below the draft tube. These areas combine to provide **back** **mixing** of the liquids. The centrifugal impeller forces such back mixed liquids up the heat exchanger tubes. In the excursion up. . .

SUMMARY:

BSUM(11)

The heat exchanger tubes may be considered to be a "**plug** **flow**" reactor, that is, a type of reactor wherein previously mixed constituents are moved straight through tubing wherein a reaction of. . .

SUMMARY:

BSUM(12)

The . . . of sequential operations: first, mixing and reacting the raw materials in the back mix area; second, reacting materials in the **plug** **flow** area of the apparatus; third, **back** **mixing** the reacted materials along with the raw materials; fourth, reacting the materials in the **plug** **flow** portion of the apparatus, and so on, to infinity.

SUMMARY:

BSUM(13)

Depending . . . the tube) to vary the residence time of the liquid in the back mix area of the apparatus and the **plug** **flow** area of the apparatus.

SUMMARY:

BSUM(15)

In . . . through the heat exchanger tubes during which they may have a residence time of approximately ten seconds during which a **plug** **flow** reaction takes place. A small portion of product is removed at the top of the heat exchanger tubes. That product. . .

DETDESC:

DETD(12)

In . . . per minute. The thus mixed reactants pass upwardly through the heat exchanger tubes 30 wherein reaction continues as in a **plug** **flow** process.

DETDESC:

DETD(14)

This . . . (R.sub.1)b, (R.sub.2)b . . . (R.sub.n)b represents the back mix reaction process. (R.sub.1).sub.p, (R.sub.2).sub.p . . . (R.sub.n)p represents the **plug** **flow** reaction process. This diagram illustrates the successive stages of back mix and **plug** **flow** processes which are performed within the single vessel.

CLAIMS:

CLMS(1)

L11 0 S L8 AND (SEPARATE VESSELS)
L12 1 S L2 AND 4472061/PN

=) d l8 1-11

1. 5,194,281, Mar. 16, 1993, **Polyol** **fatty** **acid** **polyesters** with reduced trans double bond levels and process for making; Robert W. Johnston, et al., 426/531, 549, 565, 601, 603, 611, 637, 804; 536/119, 124 [IMAGE AVAILABLE]

2. 5,158,796, Oct. 27, 1992, **Polyol** **fatty** **acid** **polyester** compositions with improved taste; Christian A. Bernhardt, et al., 426/549, 589, 601, 603, 606, 654, 804 [IMAGE AVAILABLE]

3. 5,079,355, Jan. 7, 1992, Process for the synthesis of **polyol** **fatty** **acid** **polyesters**; Yulir Meszaros Grechke, et al., 536/119, 115, 124; 554/168 [IMAGE AVAILABLE]

4. 5,071,975, Dec. 10, 1991, Process for preparing **polyol** **fatty** **acid** **polyesters**; Pleun Ver der Plank, et al., 536/119, 115, 124; 554/168 [IMAGE AVAILABLE]

5. 5,055,571, Oct. 8, 1991, Method of purifying crude **polyol** **fatty** **acid** **polyesters**; Gerard J. Van Lookeren, 536/124, 115, 119, 120, 127 [IMAGE AVAILABLE]

6. 4,973,682, Nov. 27, 1990, Process for the synthesis of **polyol** **fatty** **acid** **polyesters**; Gerardus W. M. Willemse, 536/119, 115, 120, 124, 127 [IMAGE AVAILABLE]

7. 4,973,681, Nov. 27, 1990, Process for stabilizing **polyol** **fatty** **acid** **polyesters**; Mutsuhito Watanabe, 536/119, 18.5, 115, 116, 124 [IMAGE AVAILABLE]

8. 4,518,772, May 21, 1985, Synthesis of higher **polyol** **fatty** **acid** **polyesters** using high soap:polyol ratios; Robert A. Volpenhein, 536/119, 124; 554/157, 168

9. 4,517,360, May 14, 1985, Synthesis of higher **polyol** **fatty** **acid** **polyesters** using carbonate catalysts; Robert A. Volpenhein, 536/119, 124; 554/157, 168

10. 4,334,061, Jun. 8, 1982, Process for recovery of **polyol** **fatty** **acid** **polyesters**; Joseph A. Bossier, III, 536/119, 20, 63, 110, 115; 554/176, 207; 560/234, 248

11. 3,963,699, Jun. 15, 1976, Synthesis of higher **polyol** **fatty** **acid** **polyesters**; George Peter Rizzi, et al., 536/119; 426/611; 554/168

=) d l9 1-4 cit kwic

1. 5,079,355, Jan. 7, 1992, Process for the synthesis of **polyol** **fatty** **acid** **polyesters**; Yulir Meszaros Grechke, et al., 536/119, 115, 124; 554/168 [IMAGE AVAILABLE]

US PAT NO: 5,079,355 [IMAGE AVAILABLE] L9: 1 of 4
TITLE: Process for the synthesis of **polyol** **fatty** **acid** **polyesters**

SUMMARY:

BSUM(38)

In a batch-wise operation the drying chamber is also suitably used as reaction vessel for the transesterification reaction. In a **continuous**

TEXT DATA FOR PATENT 3,567,396 IS NOT AVAILABLE, SEE THE MICROFILE OR PAPER INSTEAD

3,567,396 3 CLASSIFICATIONS ANS: 1

1.	422/193	OR
2.	422/201	XR
3.	422/224	XR

TEXT DATA FOR PATENT 3,679,368 IS NOT AVAILABLE, SEE THE MICROFILE OR PAPER INSTEAD

3,679,368 9 CLASSIFICATIONS ANS: 2

1.	422/134	OR
2.	159/2.2	XR
3.	159/6.2	XR
4.	159/17.3	XR
5.	159/25.1	XR
6.	159/DIG.10	XR
7.	159/DIG.36	XR
8.	422/135	XR
9.	528/308.5	XR

3. 4,449,828, May 22, 1984, Mixing apparatus; Maher L. Mansour, 366/147, 263; 422/119, 202, 227, 230

4,449,828 6 CLASSIFICATIONS ANS: 3

1.	366/147	OR
2.	366/263	XR
3.	422/119	XR
4.	422/202	XR
5.	422/227	XR
6.	422/230	XR

4. 4,472,061, Sep. 18, 1984, Method of continuously forming polyester resins; Maher L. Mansour, 366/98, 144, 149, 263, 348; 526/61; 528/281

4,472,061 7 CLASSIFICATIONS ANS: 4

1.	366/98	OR
2.	366/144	XR
3.	366/149	XR
4.	366/263	XR
5.	366/348	XR
6.	526/61	XR
7.	528/281	XR

=) d his

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     (FILE 'USPAT' ENTERED AT 13:13:30 ON 03 JUN 93)
L1           0 S 3567396/PN
L2         306 S (BACKMIXING OR (BACK MIXING)) AND (PLUG FLOW)
L3           0 S L2 AND 536/CLAS
L4           1 S 4449828/PN AND L2
L5          86 S POLYOL FATTY ACID POLYESTER#
L6           3 S L5 AND (FALLING FILM)
L7           1 S L5 AND TUBULAR
L8          11 S (POLYOL FATTY ACID POLYESTER#)/TI
L9           4 S L8 AND CONTINUOUS
L10          0 S L9 AND (SEPARATE VESSELS)
```

or semi-**continuous** operation the drying chamber and reaction vessel preferably are separate.

2. 5,055,571, Oct. 8, 1991, Method of purifying crude **polyol** **fatty** **acid** **polyesters**; Gerard J. Van Lookeren, 536/124, 115, 119, 120, 127 [IMAGE AVAILABLE]

US PAT NO: 5,055,571 [IMAGE AVAILABLE] L9: 2 of 4
TITLE: Method of purifying crude **polyol** **fatty** **acid** **polyesters**

SUMMARY:

BSUM(17)

In . . . particular, contacting times lie within the range of 1 to 30 minutes, 3 to 15 minutes being preferred. In a **continuous** operation, e.g. where the aqueous alkaline solution is in-line dosed to the crude polyester and the mixture is subsequently centrifuged,. . .

3. 4,973,682, Nov. 27, 1990, Process for the synthesis of **polyol** **fatty** **acid** **polyesters**; Gerardus W. M. Willemse, 536/119, 115, 120, 124, 127 [IMAGE AVAILABLE]

US PAT NO: 4,973,682 [IMAGE AVAILABLE] L9: 3 of 4
TITLE: Process for the synthesis of **polyol** **fatty** **acid** **polyesters**

DETDESC:

DETD(25)

In a batch-wise operation the drying chamber is also suitably used as reaction vessel for the transesterification reaction. In a **continuous** or semi-**continuous** operation the drying chamber and reaction vessel preferably are separate.

4. 4,334,061, Jun. 8, 1982, Process for recovery of **polyol** **fatty** **acid** **polyesters**; Joseph A. Bossier, III, 536/119, 20, 63, 110, 115; 554/176, 207; 560/234, 248

US PAT NO: 4,334,061 L9: 4 of 4
TITLE: Process for recovery of **polyol** **fatty** **acid** **polyesters**

DETDESC:

DETD(9)

The washed organic phase was transferred to a **continuous** extraction column and the safflower oil methyl esters were extracted with methanol at 60.degree. C. over a period of 24. . .

=> d l12 1 cit kwic

1. **4,472,061**, Sep. 18, 1984, Method of continuously forming polyester resins; Maher L. Mansour, 366/98, 144, 149, 263, 348; 526/61; 528/281 6C14

US PAT NO: **4,472,061** L12: 1 of 1 6C14

ABSTRACT:

A . . . forces the reactants up through the heat exchange tubes. The heat exchange tube portion of the vessel acts as a **plug** **flow** reactor, and the upper and lower portions of the vessel act as a back mix reactor. As reactants are admitted. . .

```
 Having .  .  .
 of said reactant mixture through the central portion of said vessel and
  along the side portions of said vessel,
 creating a **plug** **flow** of said reactant mixture at the side
  portions of said vessel,
 creating a turbulent mixing of said reactant mixture in the lower end of
  said vessels,
 **back** **mixing** said reactant mixture in the upper and central
  portions of said vessel, and
 subjecting said reactant mixture at the side portions.  .  .

=> d l4 1

1.  **4,449,828**, May 22, 1984, Mixing apparatus; Maher L. Mansour,
366/147, 263; 422/119, 202, 227, 230
                 11C14
=> d his

     (FILE 'USPAT' ENTERED AT 13:13:30 ON 03 JUN 93)
L1             0 S 3567396/PN
L2           306 S (BACKMIXING OR (BACK MIXING)) AND (PLUG FLOW)
L3             0 S L2 AND 536/CLAS
L4             1 S 4449828/PN AND L2
L5            86 S POLYOL FATTY ACID POLYESTER#
L6             3 S L5 AND (FALLING FILM)
L7             1 S L5 AND TUBULAR
L8            11 S (POLYOL FATTY ACID POLYESTER#)/TI
L9             4 S L8 AND CONTINUOUS
L10            0 S L9 AND (SEPARATE VESSELS)
L11            0 S L8 AND (SEPARATE VESSELS)
L12            1 S L2 AND 4472061/PN

=>
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